

Big Foot Beach State Park

Master Plan



Wisconsin Department of Natural Resources
December 1996

PUB NO-PR-253 96

PLAN APPROVAL

An Environmental Assessment was prepared with this Master Plan. The Master Plan and Environmental Assessment was developed with a local Citizen Advisory Committee and received 30 days of general public review including an "open house" public meeting in the City of Lake Geneva, September 26, 1996.

The Natural Resources Board reviewed and approved the Master Plan for Big Foot Beach State Park on December 4, 1996.



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TABLE OF CONTENTS

I. EXECUTIVE SUMMARY	1
II. GOAL STATEMENT AND OBJECTIVES	3
III. MANAGEMENT AND DEVELOPMENT PLANS	4
A. Project Boundary	4
B. Developments	4
C. Vegetation Management	7
D. Land Classification	9
E. Aesthetic Management	9
F. Fisheries	9
G. Water Quality Protection	9
H. Interpretive Program	10
IV. BACKGROUND INFORMATION	12
A. Regional History of the Area	12
B. Recreational Analysis of Geneva Lake Area	12
C. History of Big Foot Beach State Park	12
D. Current Park Operation	13
V. RESOURCE INVENTORIES	14
A. Land Forms, Geology and Hydrology	14
B. Wetlands, Wildlife, Fisheries and Endangered Species	14
C. Vegetation Resources	15
VI. ADDENDA	16
A. Rough Cost Estimate	16
B. Species List	17
VII. LIST OF FIGURES	
FIGURE 1. EXISTING DEVELOPMENT	24
FIGURE 2. PROPOSED DEVELOPMENT	25
FIGURE 3. VEGETATION MANAGEMENT	26
FIGURE 4. OWNERSHIP	27

I. EXECUTIVE SUMMARY

The Geneva Lake area, with its 5,262 acre world class lake, was a center for genteel recreation in southern Wisconsin as early as the late 1800's. Recreational pressure steadily increased, and by the middle 20th century it became clear that the last large parcels of undeveloped shoreline would quickly disappear. Big Foot Beach State Park was established in 1949 by the Wisconsin Conservation Commission to preserve a small part of the shoreline for public use.

Big Foot Beach State Park currently comprises 271.46 acres including about one-quarter mile of frontage on Geneva Lake with 900 linear feet of beach. The property has a 7.1 acre lagoon (Ceylon Lagoon), picnic areas, a 100 unit campground and 5.5 miles of trails. The park has been managed for intensive day use recreation, swimming, picnicking and camping (Figure 1.) Because of its proximity to the Chicago area, non-resident use is high, comprising about 75 percent.

This planning effort was prompted by the following issues: 1. the relocation of State Highway 120 proposed for the year 2001-- running through the western part of the park between Geneva Lake and Ceylon Lagoon (Figure 1), 2. a local proposal to develop public boat access to Geneva Lake from the park, 3. and a Lake Geneva School District request to acquire or lease land within the park. Additionally, it has been 23 years since the Department last addressed park master planning on this property. The last plan was prepared in 1973.

The plan proposes to redevelop the park to improve internal vehicle circulation by relocating the park entrance to the east of the property off of County Highway H (Figure 2). The park is presently accessed from State Highway 120 at the west end of the property near the lake.

The second major proposal is the development of a new boat launch facility on the south end of Ceylon Lagoon with 100 car/trailer parking set back from the lagoon. This plan recommends the construction of a navigable channel connecting Geneva Lake to Ceylon Lagoon with a double box culvert allowing passage of power boats up to 20 feet in length. The plan further proposes minor improvements to the existing 100 unit campground. These improvements include electrification of 25 sites, and an improved water distribution system. Swimming beach improvements to widen the beach area are also proposed and could include the addition of sand and wave barriers. A technical engineering and environmental study of the swimming beach area will be needed before improvements could be made.

Vegetation of the park will be managed to emphasize aesthetics and native plant communities. Major efforts will be made to control exotic plant species and promote water quality by management of wetlands south of the park. Some intensively used areas will be managed in non-native community landscapes to accommodate high levels of recreational use (Figure 3).

The plan proposes to add 111 acres of land or easements to the existing project goal of 324.16 acres, for a total acreage goal of 435.16 (Figure 4). The additions include 2 parcels. The first parcel is a 1 acre conservation easement area north of the park that includes the northern tip of the Ceylon Lagoon. The easement is desirable for the long-term recreational and environmental management of the lagoon. The second parcel is an area of 110 acres of wetlands to the south. The wetlands were added to provide a demonstration of wetlands management techniques and to improve water quality in Geneva Lake.

Water quality questions were raised regarding Buttons Bay Creek through the public review process. Department water programs will investigate the situation.

The total cost of the proposed development is \$3.7 million. Acquisition costs associated with the additions to the project boundary are estimated at \$132,000. Estimated annual tax payment to local government will be \$4,060. The Department currently operates the park with a base level of funding. The proposed additional costs of operation are projected at only \$8,300 per year.

This document was prepared with the assistance from the 10 member Citizen Advisory Committee, other interested parties of the public and Department staff.

II. GOAL STATEMENT AND OBJECTIVES

GOAL

Continue to manage and develop Big Foot Beach State Park as a state recreational park with an emphasis on waterfront recreation on Geneva Lake. Preserve the aesthetic and natural values of the land.

OBJECTIVES

- Continue day-use recreation, picnicking and swimming.
- Develop new public boat access to Geneva Lake from the lagoon.
- Continue to provide 100 campsites at modest fees.
- Provide trail-related recreational activities.
- Manage vegetation to encourage native plant and animal communities.
- Establish a demonstration program of nutrient management in the wetlands that drain to Geneva Lake.
- Establish interpretive program.

III. MANAGEMENT AND DEVELOPMENT PLANS

A. Project Boundary

This plan proposes an expansion of the current project boundary by 111 acres. This expansion will be accomplished through a combination of easements and fee acquisition. (Figure 4).

A conservation easement of 1 acre is proposed that would include the northern tip of Ceylon Lagoon on an adjoining youth camp. The easement is contingent upon negotiations with the property owner. The easement would be limited to protection of the shoreline and allow park rules (Code NR 45, Administrative Rules) enforcement of boating regulations that are needed to manage the lagoon from a recreational and environmental perspective.

The proposed easement would not include public access to the lagoon and the youth camp would retain its rights to utilize the easement area for its camp programs. The youth camp is currently a compatible land use buffering the park from development. Should the ownership of the youth camp change, the natural resource values of that northern part of the lagoon could be lost to development and conflicting recreational use.

The second proposed expansion includes 110 acres of wetlands along the southern edge of the park's existing project boundary. The proposed expansion will have several desirable consequences: protect water quality in Geneva Lake, buffer the park from development and disturbance, preserve views to the south, and allow some limited trail-related recreation.

Moreover, the 110 acres of wetland warrant inclusion because it represents an opportunity to demonstrate ways to control nutrient runoff and improve water quality. This wetland feeds into a small seasonal stream, Buttons Bay Creek, that discharges into Geneva Lake contributing high levels of nutrient during heavy run off periods. The wetland is dominated by reed canary grass, an exotic, nutrient rich species.

This wetland could be secured through fee acquisition or management easements to meet the plan's main management objectives. Fee acquisition might be needed if recreational trails were developed on these parcels.

The Department's land acquisition policy is on a willing seller basis and is contingent on the availability of funds.

B. Developments

The park will be managed to provide the following recreational activities: tent and trailer camping, picnicking, swimming, and boat launch access to Geneva Lake. Trail-related activities include hiking/nature trail, on road biking, cross-country skiing, and limited snowmobiling.

1. Road System

The plan proposes a major redevelopment of facilities within the park to accommodate relocation of State Highway 120; improve access and circulation to campgrounds, day-use areas, and the service area; make improvements to swimming beach and campgrounds; and develop a new boat launch that would provide navigable access to Geneva Lake.

This proposal includes a new park entrance from the east to accommodate the relocation of State Highway 120. It will provide a single, controlled vehicle access site for the park. This entrance should reduce vehicle traffic conflicts near the beach/lakefront located on the west end of the park. A new two-way park road would be developed with public contact area, connector road to the service area, campgrounds, day-use area and boat launch area. Several portions of existing internal roads would be abandoned and replanted to blend with natural surroundings (Figure 2).

2. Boat Launch, Navigable Channel, Pedestrian Underpass

The new boat launch facility, which adds 4 ramps and 2 boarding piers, will be constructed on the south end of Ceylon Lagoon with 100 car/boat trailer parking set back from the lakefront. The launch area will include 4 car/boat trailer sites that will meet the requirements of the Americans with Disabilities Act.

It's important to note that because camping is offered in the park, a portion of the boat launch parking and the campgrounds may be utilized by campers for long-term boat storage. This could reduce, perhaps by 25 percent, the boat launch parking stalls available for daily users and reduce the turnover potential of the launch facility. In conjunction with local governments, the Department will develop a long-term public boat access management plan for Geneva Lake.

This proposal includes a navigable channel, 4 feet deep, and a double box culvert (12 feet X 12 feet each) to accommodate powered fishing type boats up to 20 feet in length. Eighty-nine percent of boats entering Geneva Lake are 20 feet or less in length, according to a recent study by the Geneva Lake Environmental Agency. This double box culvert would allow cars to pass overhead. The size and type of watercraft that could use the navigational channel and box culverts would be limited to car-top boats/canoes, trailered powerboats and small sailboats with retractable keels and stepped masts. The proposed navigable channel also includes the placement of an additional (8 feet X 8 feet) box culvert pedestrian underpass. The underpass will provide a safer alternative for pedestrians crossing the road.

Park rules would be established that will restrict operation, size and type of water craft. These rules will reflect the specific design limitations of the culverts and navigation channel, and help prevent environmental damage.

To protect the navigable channel/culverts from westerly storms, a combination of a breakwater/fishing pier with a few slips for small boats will be constructed at the mouth of

the channel. The boat slips would allow small boats to tie up and rigup equipment after passing through the box culvert.

The culverts should be long enough to accommodate a bike shoulder on the roadway. The current roadway, State Highway 120, will be discontinued as a state highway and designated a local road; a change in designation to take effect after 2001. Reduced traffic volume on this road will provide a safer beach and waterfront environment than presently exists.

This plan proposes no additional separate boat launch fees. Instead, persons interested in launching a boat would pay for a daily park admission or purchase the annual park entrance sticker in accordance with the park's vehicle fee structure. Under the current fee structure residents would pay \$5.00 for a daily launch or \$18.00 annually; non-residents would pay \$7.00, or \$25.00 annually. This boat launch fee policy would keep daily launch fees slightly below neighboring launch fee costs and would be adjusted periodically when statewide park entrance fees are adjusted.

It is estimated that increased park use and revenue generated by the boat launch will offset increased operational costs created by the boat launch. Some additional costs are anticipated, increased staffing for supervision of boat launch on busy weekends and long-term building maintenance associated with a fish cleaning station. With current levels of state park road aids funding, the park should be able to meet costs associated with road and parking lot maintenance.

The Department will promulgate administrative rules (NR 45) to prohibit the general beaching of water craft along the lagoon shoreline except at designated locations. This will be done to protect the lagoon's shoreline from damage by overuse.

3. Swimming Beach

The beach area could be enhanced by the addition of a sand blanket, a small breakwater and groins to retain sand and build the beach. A detailed engineering and environmental study will be prepared to evaluate other solutions balancing recreational benefits with environmental impacts. Existing fencing along the waterfront road will be maintained to concentrate pedestrian traffic providing a safer crossing from the park to the beach.

4. Camping

The existing campground will be maintained in its current location. The facility is designed to accommodate 67 trailer/campers. A separate campground loop can accommodate 33 tent campsites. Campers are allowed to stay in the park for a maximum of 21 days in a 4-week period. Only modest improvements are proposed for the campgrounds, more water outlets, 25 electric sites for the trailer campgrounds, and minor road adjustments to better separate the two types of camping. Wisconsin statutes limit electrification of the state park system. Consequently, 25 electrical service sites must be removed from other locations in the state park system, so there is no net increase.

5. Picnicking

The day use parking area would be displaced by the boat launch facilities. However, a new picnic area parking lot for 95 cars, including sites for people with disabilities, will be constructed to the east to provide access to the upland picnic area. Overall, there would be no reduction of picnic area parking. However, the boat launch parking and ramps would displace picnicking use from the south part of the lagoon to an upland site east of the boat launch parking.

6. Projected Park Development Costs Construction Projects

New entrance road system, contact area	\$ 498,700
Road abandonment of existing park roads	\$ 46,900
Campground redevelopment	\$ 31,900
Picnic area parking lot	\$ 65,700
Boat launch and parking 100 car/trailer	\$ 668,500
Beach improvement	\$ 44,200*
Breakwater/fishing access	\$ 280,800
Boat channel and double culverts, road	\$ 557,600
Pedestrian Underpass	\$ 76,000
Aquatic weed control in lagoon	<u>\$ 3,000</u>
Total Construction Project Costs (1996)	\$2,273,200
Unknown factors (10%)	\$ 227,300
Mobilization (2%)	\$ 46,500
Contingencies (10%)	\$ 227,300
Engineering (10%)	<u>\$ 227,300</u>
Subtotal (1996)	\$ 2,899,300
Inflation delay est. 5 yrs. at 4% @	<u>\$ 627,500</u>
Total Projected Development Costs (2001)	\$3,700,000**

* Beach improvements will require a technical study, estimated at an additional \$20,000.

** See detailed rough cost estimate in addenda. Figures are rounded.

C. Vegetation Management

Most of the land will be managed to protect the aesthetic qualities of the park and provide a diversity of native habitats that include: oak savanna, southern hardwoods, bottomland forest, and prairie. To accommodate intensive recreation, non-native plant communities, including old field grassland type, scattered landscape trees and lawns will be maintained. (Figure 3).

1. Prairie

True prairie restoration is suggested in only a small area of the park due to the intense management that must occur before, during and after a restoration. This would involve buying seed from a local source, preparing the ground properly and managing by fire or mowing.

2. Savanna/Scattered Trees

Savanna restorations should occur in areas that already have scattered trees, picnic areas, campgrounds and lawn areas. These areas are already mowed and would only involve some planting or transplanting of native species in low-traffic areas.

3. Conifer/Hardwoods

In the area adjacent to the campgrounds and Badger High School, it is suggested that additional pines, spruces and hardwoods be planted for screening. The planting of these species would link the oak forest areas and provide cover for wildlife.

4. Grassland

The grassland area south of the proposed park road should be managed by mowing or burning. An occasional direct seeding of some prairie species would be beneficial.

5. Bottomland Forest

Bottomland forest areas will be managed to control exotic plant species. Hand cutting of exotic shrubs understorey will be the main management objective.

6. Woodland Southern Hardwoods

The oak/hickory woodland area needs to be managed for invasive species through prescribed burning.

7. Exotic Vegetation Management

Some areas of the park need to be intensively managed for exotic species such as honeysuckle, garlic mustard and reed canary grass. A combination of hand labor, chemical application, burning and mowing is recommended. Often this management technique is species specific. Without this management several exotic species will invade the entire park and crowd out native communities.

8. Lagoon Aquatic Plants

It is recommended that native wetland vegetation be planted around the lagoon for demonstration purposes as well as shoreline erosion control. It is further recommended that after eradication of the exotic species Eurasian milfoil from the lagoon that management efforts encourage the revegetation of the bottom of the lagoon to inhibit suspension of soft bottom material. Mechanical harvesting, it is suggested, should be done in waters deeper than 6 feet.

D. Land Classification

By state park system standards, Big Foot Beach is a relatively small property and is surrounded by highly developed residential neighborhoods. The park's historical use has been intensive outdoor recreation, swimming, day use picnicking and camping. With the addition of a major boat launch this pattern of recreational use will increase.

It is proposed that the entire property be classified as a type 4 recreational use setting, in accordance with the Department's master planning, management and recreational use classification system. The objective of this setting is to provide and designate areas offering opportunities for intensive recreational use activities and experience. Recreational facilities provide a relatively high level of user comfort, convenience and environmental protection. The sights and sounds of human activity are common. Recreational uses are mixed and may be highly diverse with well developed road and trail systems.

E. Aesthetic Management

The Department's objective is to maintain the aesthetic quality of the park to the maximum extent possible. This objective is met here through vegetative management, and locating the new park entrance at the southeastern corner of the property consistent with minimizing impacts of roads and parking lots. Locating launch facilities on the lagoon out of the view shed of the main body of Geneva Lake is also a reflection of the policy to protect aesthetic quality.

Approximately 90 percent of the property will remain in natural condition under this plan proposal. Abandoned internal park roads will be regraded to natural contours and replanted to blend with surroundings.

F. Fisheries

The park lagoon and shoreline of the park are popular fishing spots. Additionally, the lagoon has been used in the Department's Urban Fishing Program involving frequent stocking of trout in the spring and fall, and a youth fishing instructional program. It is anticipated that the Youth Fishing Program will continue to utilize the park after the lagoon is connected to the lake. The Department will evaluate the new use patterns for the lagoon and make a determination if the Youth Fishing Program and boat launch facilities can co-exist on the south end of the lagoon.

Connecting the lagoon to the lake could have a positive effect on the quality of fishing in the lagoon. In addition, it could provide access to spawning habitat for warm water fish species naturally found in Geneva Lake. Any regulation of fishery is accomplished through statewide fishing programs.

G. Water Quality Protection

The plan will attempt to improve water quality protection by inclusion of the wetlands to the south of the existing project boundary. Wetlands will be actively managed by burning to convert to native community. This could reduce, but probably not eliminate, nutrient loading

from the wetland runoff, some of which has accumulated in low areas of the marsh through historic agricultural practices.

Location of launch facilities in the lagoon will protect the main body of Geneva Lake from small accidental oil and gas spills associated with launch use. The lagoon allows easy containment and clean-up should spills occur.

Analysis of core samples taken in May, 1996 from several sites in Ceylon Lagoon sustain the conclusion that the lagoon is comprised of aquatic sediments typically found in southeastern Wisconsin. The primary area of concern in Ceylon Lagoon is the resuspension of soft bottom material by the expected increase in boat traffic.

The presence of rooted aquatic weeds (macrophytes) and the fairly high proportion of clay on the lagoon floor will function as a stabilizing force to sediment suspension. It is suggested that boating traffic be managed to lessen suspension of soft sediment. To minimize suspension of lagoon sediment the following is recommended:

1. Boats not be allowed to "power load", using the thrust of the motor in loading a boat onto a trailer.
2. Boats be kept away from the shoreline to the extent practical. This will result in boats using areas that comprise deeper waters.
3. Implementing and enforcing a no wake speed.
4. Following the proposed eradication of Eurasian milfoil from the lagoon, management efforts should encourage the revegetation of the bottom of the lagoon with native aquatic vegetation. No chemical treatment of rooted aquatic vegetation should be allowed except to control exotic species. Mechanical harvesting of aquatic vegetation should be done in deeper water (greater than 6 feet).

To manage the lagoon from both a recreational and environmental standpoint the Department will promulgate rules (NR 45) regarding limits on watercraft size and their operation within the entire lagoon and navigation channel.

Additionally, questions have been raised during the public review process about the water quality of Buttons Bay Creek. Department water programs will investigate the matter.

H. Interpretive Program

Currently, the park interpretation program consists of self-guided nature trails. The majority of park users are from the metropolitan Chicago area. This is a highly urbanized population and the need for interpretation is significant. There is an opportunity here to reach an audience who might not otherwise learn about the environment.

This plan proposes to use Limited Term Employees, a naturalist, or local volunteers to develop evening programs, children's programs and guided hikes for park peak use times.

Roving naturalist contacts with live animals and specimens would be the best way to pique curiosity and develop interest in the naturalist programs.

Some additional non-personal interpretive devices which could be developed include a butterfly garden, bird feeding station, composting station, recycling station, tree identification and interpretation of the prairie restoration.

I. Anticipated Increases in Capital Supplies and Operation Costs

Boat launch weekend supervision (LTE 14-week season)	\$ 2,000
Management of breakwater slips management	\$ 500
Environmental supplies	\$ 1,000
Hand held radio	\$ 800
Interpretive program	\$ 2,000
Vegetation management per year	<u>\$ 2,000</u>

Total new operational costs.	\$ 8,300
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IV. BACKGROUND INFORMATION

A. Regional History of the Area

The Geneva Lake area is located in the southeastern corner of Wisconsin in Walworth County. The 6th largest natural lake in Wisconsin, Geneva Lake with its high, sloping banks and clear waters was the magnet that attracted economic development of the area in the 19th century. Frontage towns Fontana, Williams Bay, and the former Town of Lake Geneva were all settled in 1836. As is typical of the wider Middle Western region, Native Americans were forced to resettle to make room for white settlement and economic expansion. As is also typical of the region the mere prospect of building a railroad line stimulated growth in the area. A permanent railroad line was created in 1871 leading to the Village of Lake Geneva. Lake Geneva subsequently became a city in 1886.

During the late 19th century the area became a fashionable resort and summering location, a trend that was accelerated by the great Chicago fire of 1871. Many of the enormous summer cottages and estates on Geneva Lake date from this period when wealthy Chicago families who had lost their homes and businesses to the fire simply moved to the area while the city was being restored.

Although the area is not the exclusive vacationing destination it once was, the area resources that attracted past settlement remain intact due to dedicated, local preservation efforts.

B. Recreational Analysis of Geneva Lake Area

Big Foot Beach is a recreational facility located in an area that has long been a major attraction as an exclusive summer retreat, and more recently as a tourist destination open to public use. Many of the formerly large estates built on the shores have been subdivided into smaller residential lots. Several youth camps and resorts are found in the lake region, and numerous small towns in the vicinity of the park serve as local trading centers and recreational bases.

Public boating access to Geneva Lake is presently available at the City of Lake Geneva (19 spaces), the Village of Williams Bay (39 spaces), the Village of Fontana (52 spaces), and the Town of Linn (26 spaces). At this time non-reserved car/trailer units number 139 spaces. The City of Lake Geneva is expected to discontinue its boat launch facilities (19 spaces) in the near future. In addition, the Village of Fontana could withdraw an additional 52 spaces without notice. Other boat accesses at town and county sites are subject to Department review.

Area recreational facilities include Bong Recreation Area 12 miles to the east, and Kettle Moraine State Forest 25 miles to the north.

C. History of Big Foot Beach State Park

The earliest known human presence in the vicinity of Big Foot Beach State Park is evidenced by a prehistoric Indian village site recorded in 1928. The large archeological site is located southwest of the park. Not much is known about the site, but local knowledge refers to the Potawatomi presence and a chief named Big Foot who lived on the shores of Geneva Lake.

Local legend claims "Big Foot" was a nickname applied by a brother-in-law of the chief after seeing the size of the chief's tracks made on snow-covered ice on the lake. Today Big Foot's legend lives on in the name of the state park.

Even before the arrival of the railroad in 1871, Lake Geneva became a popular resort area as its deep, clear waters attracted economically prominent families from Chicago who established estates along the lake's shores. Property that once belonged to the famous Maytag family subsequently underwent several ownerships and attempts at residential subdivision before being purchased in 1949 from Martin Fox for state park purposes. Much of the 116 acres was used for farming. The property included Ceylon Lagoon, which reportedly was enlarged to its present size by one of Maytag's sons. Heavy park usage prompted a second major acquisition of 182 acres of adjacent farmland in 1953 from Marion Isbell of Chicago.

Creation of Big Foot Beach State Park returned a portion of Geneva Lake's shores to general public enjoyment. Today the park continues to serve the recreational needs of southern Wisconsin and northern Illinois swimmers, boaters, picnickers and campers.

D. Current Park Operation

The park itself features the lake as its primary user attraction; therefore, much of the function of the park is day-use picnicking, sunning, swimming, boating and fishing. Numerous game fish are found in Geneva Lake, which holds a reputation for its fishing, both in summer and winter. There is a 100 unit campground in the park. The park received about 161,500 day users and 16,500 campers in 1995.

The state park system is required by law to collect reasonable fees to defray usually half the operational costs. The Department currently collects fees for vehicle entrance; for residents \$18.00 annually, \$5.00 daily; and for non-residents \$25.00 annually, \$7.00 daily. Wisconsin residents pay camping fees of \$9.00/day on weekends, \$7.00/weekdays; non- resident \$11.00/day on weekends and \$9.00/weekdays.

It currently costs about \$152,600 annually to operate Big Foot Beach State Park. The property is staffed by 2 full-time and 8 limited-term employees for a 14-week season.

V. RESOURCE INVENTORIES

A. Land Forms, Geology and Hydrology

Big Foot Beach lies in the geographic area of Wisconsin called the "Eastern Ridges and Lowlands". The primary bedrock near the surface is Niagara Limestone. In most places it is overlain by a mantle of sand, gravel and clay glacial drift. The area is an extension of the Kettle Moraine, a hilly terrain region, but its topographic features are less pronounced.

Ceylon Lagoon, a small artificial, warmwater pond, has an area of 7.1 acres with a maximum depth of 12 feet on its south end. It is located on the west end of the park separated from Geneva Lake by State Highway 120 and 50 feet of filled land. The shape of the lagoon is said to resemble Geneva Lake although a close examination reveals only a slight resemblance.

Geneva Lake was also formed by glacial activity. The lake lies in a pre-glacial valley filled with 220 feet of glacial drift, material deposited by glaciers 10,000 years ago. Lake Como, Lake Delavan and several other large lakes are located in the area.

Geneva Lake is approximately 7.75 miles long and averages a little over 1 mile in width. A dam established in 1836 maintains a 10 foot head and forms an outlet that becomes the White River flowing through the City of Lake Geneva. The lake has a volume of 320,984 acre feet with a maximum depth of 135 feet. It is a deep, cold water (oligotrophic) lake with both a cold and warmwater fishery. The lake has 20.2 miles of shoreline. Several municipalities are located on the lakeshore. Only small surface streams drain into Geneva Lake. Most of the water comes from groundwater sources.

B. Wetlands, Wildlife, Fisheries and Endangered Species

Wetlands are found in two general locations in the park. The area surrounding the lagoon was historically wetland, much of it filled with materials from the lagoon. The land south of the park is part of an extensive wetland complex in the region. A portion of the wetland drains into a small intermittent creek flowing into Geneva Lake near the park beach.

Wildlife species found in the park are typical of the surrounding farm land and suburbs. (See species list in addenda).

The fisheries of Ceylon Lagoon consist of warmwater species, such as bluegill, bass, and bullhead. The lagoon is used as part of the Department urban fishing and fishing skills youth program and is stocked with trout in the early season. This program provides some of the earliest fishing opportunities in this part of the state.

Geneva Lake is the sixth largest lake in the state. It is managed for smallmouth and largemouth bass, panfish, walleye, northern pike and cisco. Lake trout and brown trout are present in low numbers. The lake receives heavy fishing pressure in the spring and winter, moderate pressure in the summer and fall. The intermittent creek that passes through the southwest corner of the park has several minnow species seasonally.

A check of the Department's Threatened or Endangered Species List indicates there are no known threatened or endangered species in the park area. However, the longear sunfish, a state threatened species, is found in Geneva Lake.

C. Vegetation Resources

The park's vegetation has been highly manipulated by past farming practices. The western third of the park has old growth southern hardwood such as oak, hickory, and cherry. Much of the forest understory is comprised of non-native plants i.e., buckthorn, honeysuckle, etc. Areas near the lagoon contain bottomland forest, European alder, silver maple, green ash, and a few old field plants. The upland areas have been used for row crops and have reverted to heavy grassland cover of non-native grasses. It will be possible to restore a diversity of native habitats that include oak savanna, southern hardwoods, bottomland forest, prairie, some non-native old field grasslands and limited landscape trees and lawn.

VI. ADDENDA

A. Rough Cost Estimate

WORK ITEM:	UNIT COST	ALT. A QUANTITY	ALT. A COST \$	%

DEMOLITION:				
STH 120	2.93 /SY	2287 SY	6,800	0%
PARK ENTRANCE	2.93 /SY	1015 SY	3,000	0%
PARKING LOT	2.93 /SY	4167 SY	12,200	1%
OTHER PARK ROADS	2.93 /SY	10619 SY	31,100	1%
GRUB TREES	14275.00 /AC	2 AC	24,300	1%
REMOVE FENCING	0.55 /LF	600 LF	300	0%
EXCAVATION	4.74 /CY	5152 CY	24,400	1%
EXISTING BRIDGE STH 120	44000.00 EA	1 EA	44,000	2%
CONTACT STATION	0.20 /CF	3000.00 CF	600	0%
PIT TOILETS	0.25 /CF	0.00 CF	0	0%
NEW WORK:				
STH 120	28000.00 /ST/	7 ST	191,800	8%
OTH RD FACT DTCH/TILE/ETC	0.50 X		95,900	4%
BKE LANES (1 EA. DIR.)	473.00 /ST/	31 ST	14,900	1%
NEW PARK ROADS	15.46 /SY	17315 SY	267,700	12%
OTHER NEW RDS/TURNS.ETC	15.46 /SY	0 SY	0	0%
DOUBLE BOX CULV (BOATS)	95400.00 /EA	1 EA	95,400	4%
BOX CULV (PEDESTRIAN)	40000.00 /EA	1 EA	40,000	2%
RELOCATE UTILITIES	5000.00 /EA	1 EA	5,000	0%
ADD LIFT STATION	100000.00 /EA	1 EA	100,000	4%
BEACH GROINS	28.00 /CY	243 CY	6,800	0%
BEACH SAND	8.50 /CY	4400 CY	37,400	2%
LAUNCH RAMPS	50.00 /SF	3200 SF	160,000	7%
PIERS	30.00 /SF	960 SF	28,800	1%
LAUNCH AREA	15.46 /SY	2978 SY	46,000	2%
STAGING AREA	15.46 /SY	0 SY	0	0%
DREDGING	8.28 /CY	590 CY	3,700	0%
BREAKWATER	1000.00 /LF	270 LF	270,000	12%
RIPRAP	30.00 /CY	400 CY	12,000	1%
CURB/GUTTER	8.00 /LF	330 LF	2,600	0%
CONTACT STATION	50.00 /SF	1200 SF	60,000	3%
FISH CLEAN STATION	150000 EA	1 EA	150,000	7%
ADA PARKING (4 STALLS)	15.46 /SY	317 SY	4,900	0%
PARKING LOT (100 STALLS)	15.46 /SY	6240 SY	142,900	6%
OTHER PARKING	15.46 /SY	4250 SY	65,700	3%
ATTENDANT BOOTH	50.00 /SF	0 SF	0	0%
LIGHTING	2000.00 /EA	15 EA	30,000	1%
PATHS	8.71 /SY	590 SY	5,100	0%
ELEC. @ CAMPSITES	1000.00 /EA	25 EA	25,000	1%
WATER SPIGOTS @ CAMPSIT	2300.00 EA	3 EA	6,900	0%
TOPSOIL (4")	2.67 /SY	37000 SY	98,800	4%
FENCING	12.00 /LF	600 LF	7,200	0%
DRAINAGE	25.00 /LF	40 LF	1,000	0%
TREES	227.00 /EA	50 EA	11,400	1%
SHRUBS	50.00 /EA	150 EA	7,500	0%
EROSION CONTROL	1.20 /LF	1000 LF	1,200	0%
ENTR. SIGN	1000.00 /EA	1 EA	1,000	0%
AUX. SIGNS	100.00 /EA	12 EA	1,200	0%
SEED/MULCH/FERT.	0.75 /SY	37000 SY	27,800	1%
FINE GRADING	2.85 /SY	37000 SY	98,100	4%
WETLAND MITIGATION	3500.00 /AC	0 AC	0	0%
WEED CONTROL POND	3000.00 EA	1 EA	3,000	0%
SUB-TOTAL			\$2,273,200	
FACTOR FOR UNKNOWN (10%)			227,300	10%
MOBILIZATION (2%)			45,500	2%
ENGINEERING (10%)			227,300	10%
CONTINGENCY (10%)			227,300	10%
SUB-TOTAL			\$3,000,800	
YRS DELAY @4%			650,100	
TOTAL			\$3,700,000	

B. Species List of the Big Foot Beach State Park Area

The species lists below were compiled in the following manner. A species list from the master plan (completed in 1967 by George Knudsen) was used as a base. After a follow-up investigation and consultation with Citizen Advisory Committee member Mary Koutsky, the species were either confirmed or listed as probable. A probable listing means a species was not confirmed but was probably present as site conditions and habitats likely supported these species. The park needs to be surveyed during the growing season to confirm the probable listings and to expand the list.

CODE KEY: C--Confirmed P--Probable E--Exotic

VASCULAR PLANTS

<u>Genus & Species</u>	<u>Common Name & Code</u>
TREES	
<i>Acer negundo</i>	Box Elder (C)
<i>Ulmus rubra</i>	Slippery Elm (P)
<i>Ulmus americana</i>	American Elm (C)
<i>Prunus serotina</i>	Black Cherry (C)
<i>Alnus glutinosa</i>	European Alder (C,E)
<i>Quercus macrocarpa</i>	Bur Oak (C)
<i>Quercus rubra</i>	Red Oak (C)
<i>Quercus alba</i>	White Oak (C)
<i>Quercus velutina</i>	Black Oak (C)
<i>Populus tremuloides</i>	Quaking Aspen (C)
<i>Populus deltoides</i>	Cottonwood (C)
<i>Populus alba</i>	Silver Poplar (P,E)
<i>Populus grandidentata</i>	Bigtooth Aspen (P)
<i>Betula papyrifera</i>	Paper Birch (C)
<i>Salix nigra</i>	Black Willow (C)
<i>Morus rubra</i>	Mulberry(P)
<i>Carya ovata</i>	Shagbark Hickory (C)
<i>Acer saccharinum</i>	Silver Maple (C)
<i>Acer saccharum</i>	Sugar Maple (C)
<i>Robinia pseudo-acacia</i>	Black Locust (C,E)
<i>Gleditsia triacanthos</i>	Thornless Honey Locust(P)
<i>Tilia americana</i>	Basswood (C)
<i>Pinus resinosa</i>	Red Pine (C)
<i>Pinus strobus</i>	White Pine (C)
<i>Fraxinus americana</i>	White Ash (C)
<i>Fraxinus pennsylvanica</i>	Green Ash (C)
<i>Sycamore occidentalis</i>	American Sycamore (P)

SHRUBS & VINES

Crataegus spp.
Rhamnus cathartica
Viburnum acerifolium
Lonicera tatarica
Salix interior
Rhus glabra
Rhus radicans
Sambucus canadensis
Ostrya virginiana
Rosa multiflora
Rubus spp.
Berberis vulgaris
Cornus stolonifera
Parthenocissus quinquefolia
Vitis spp.
Rhus toxicans

Hawthorn (C)
Common Buckthorn (C,E)
Mapleleaf Viburnum (P)
Tatarian Honeysuckle(C,E)
Sandbar Willow (P)
Smooth Sumac (C)
Poison Sumac (P)
Elderberry (P)
American Hornbeam (C)
Multiflora Rose (C,E)
Raspberry & Blackberry(C)
Barberry(P,E)
Red-osier Dogwood (C)
Virginia Creeper (C)
Wild Grape (C)
Poison Ivy (C)

FORBS

Circaea quadrisulcata
Geum alleppicum
Geum canadense
Prunella vulgaris
Euphorbia corollata
Polygonum spp.
Taraxacum officinalis
Hieracium spp.
Monarda fistulosa
Lespedeza capitata
Rudbeckia hirta
Arctium minus
Leonurus cardiaca
Nepeta cataria
Chenopodium album
Solanum dulcamara
Echinocystis lobata
Physalis spp.
Solidago altissima
Solidago spp.
Asclepias verticillata
Asclepias incarnata
Asclepias syriaca
Potentilla spp.
Plantago major
Achillea millefolium
Melilotus alba
Melilotus officinalis

Enchanter's Nightshade(C)
Yellow Avens (C)
White Avens(C)
Heal-all (P,E)
Flowering Spurge (P)
Knotweeds (P)
Dandelion (C,E)
Hawkweeds (P)
Wild Bergamot (C)
Round-headed Bush Clover (P)
Black-eyed Susan (P)
Common Burdock (C,E)
Motherwort (C,E)
Catnip (P,E)
Lamb's Quarters (P,E)
Bittersweet Nightshade (C,E)
Wild Cucumber (P)
Ground Cherries (P)
Tall Goldenrod (C)
Goldenrods (C)
Whorled Milkweed (P)
Swamp Milkweed (P)
Common Milkweed (C)
Cinquefoils (P)
Plantain (C,E)
Yarrow (C,E)
White Sweet Clover (C,E)
Yellow Sweet Clover (C,E)

Trifolium repens	White Clover (C,E)
Trifolium pratense	Red Clover (C,E)
Medicago sativa	Alfalfa (P,E)
Ambrosia artemisiifolia	Common Ragweed (C)
Ambrosia trifida	Giant Ragweed (C)
Lepidium spp.	Peppergrass (P)
Capsella bursa-pastoris	Shepherd's Purse (P,E)
Amphicarpa bracteata	Hog Peanut (P)
Prenanthes alba	White Lettuce (P)
Geranium maculatum	Wild Geranium (C)
Oxalis stricta	Yellow Wood-sorrel (P)
Podophyllum peltatum	Mayapple (C)
Erigeron annuus	Daisy Fleabane (P)
Carduus nutans	Nodding Thistle (P,E)
Cirsium vulgare	Bull Thistle (P,E)
Cirsium arvense	Canada Thistle (P,E)
Verbena hastata	Blue Vervain (P)
Urtica dioica	Stinging Nettle (P)
Polygonatum biflorum	Solomon's Seal (P)
Smilacina racemosa	False Solomon's Seal (P)
Smilacina stellata	Starry False Solomon's Seal (P)
Oenothera biennis	Common Evening-primrose (P)
Helianthus spp.	Sunflowers (P)
Impatiens biflora	Spotted Jewelweed (C)
Verbascum thapsus	Common Mullein (C,E)
Aster novae-angliae	New England Aster (C)
Aster pilosus	Frost Aster (C)
Aster spp.	Asters (P)
Pilea pumila	Clearweed (P)
Asparagus officinalis	Asparagus (C,E)
Apocynum androsaemifolium	Spreading Dogbane (P)
Anemone virginiana	Tumbleweed (P)
Heracleum maximum	Cow Parsnip (P)
Rumex crispus	Curled Dock (C,E)
Antennaria spp.	Pussytoes (C)
Daucus carota	Wild Carrot (C,E)
Convolvulus sepium	Hedge Bindweed (P)
Convolvulus arvensis	Field Bindweed (P,E)
Tanacetum vulgare	Common Tansy (C,E)
Fragaria virginiana	Wild Strawberry (C)
Viola spp.	Violets (C)
Coronilla varia	Crown-vetch (C,E)
Veronicastrum virginicum	Culver's Root (P)
Cichorium intybus	Chicory (P,E)
Hepatica acutiloba	Sharp-lobed Hepatica (C)
Claytonia virginica	Spring Beauty (C)
Symplocarpus foetidus	Skunk Cabbage (C)

Caltha palustris
Alliaria officinalis
Ratibida pinnata
Saponaria officinalis
Typha latifolia
Dodecatheon meadia
Anemone canadensis
Anemone quinquefolia
Uvularia sessilifolia
Trillium recurvatum
Chrysanthemum leucanthemum
Ajuga reptans
Allium canadense
Iris versicolor
Thalictrum dioicum
Arisaema spp.

GRASSES

Setaria spp.
Agropyron repens
Phleum pratense
Calamagrostis canadensis
Bromus spp.
Phalaris arundinacea
Equisetum arvense
Andropogon gerardi
Andropogon scoparius
Sorghastrum nutans
Poa pratensis
Carex spp.

Oedocoileus virginianus
Ondatra zibethica
Sciurus niger
Sciurus carolinensis
Citellus tridecemlineatus
Tamias striatus
Marmota monax
Sylvilagus floridanus
Microtus pennsylvanicus
Peromyscus maniculatus
Peromyscus leucopus
Blarina brevicauda
Myotis lucifugus
Eptesicus fuscus

Marsh Marigold (C)
 Garlic Mustard (C,E)
 Gray-headed Coneflower (C)
 Bouncing Bet (P,E)
 Cattail (C)
 Shooting Star (C)
 Canada Anemone (C)
 Wood Anemone (C)
 Wild Oats (C)
 Prairie Trillium (C)
 Ox-eye Daisy (C,E)
 Bugle (C,E)
 Wild Garlic (C)
 Larger Blue Flag (C)
 Early Meadow Rue (C)
 Jack-in-the-Pulpit (C)

Bristly Foxtails (P)
 Quackgrass (C,E)
 Timothy (C,E)
 Bluejoint (P)
 Brome Grass (C,E)
 Reed Canary Grass (C,P)
 Horsetail (P)
 Big Bluestem (C)
 Little Bluestem (C)
 Indian Grass (C)
 Kentucky Bluegrass (C,E)
 Sedges

MAMMALS

Whitetail Deer (C)
 Muskrat (C)
 Eastern Fox Squirrel (P)
 Eastern Gray Squirrel (C)
 13-lined Ground Squirrel (C)
 Eastern Chipmunk (C)
 Woodchuck (P)
 Eastern Cottontail (C)
 Meadow Vole (C)
 Deer Mouse (P)
 White-footed Mouse (P)
 Shorttail Shrew (P)
 Little Brown Bat (P)
 Big Brown Bat (P)

Lasiurus borealis
Didelphis marsupialis
Procyon lotor
Mephitis mephitis
Mustela vison
Lutra canadensis
Vulpes fulva
Sylvilagus floridanus

Red Bat (P)
Opossum (C)
Raccoon (C)
Striped Skunk (C)
Mink (P)
River Otter (C)
Red Fox (P)
Eastern Cottontail (C)

REPTILES & AMPHIBIANS

Thamnophis sirtalis sirtalis
Storeria occipitomaculata
Storeria dekayi dekayi
Chytsemys picta picta
Ambystoma maculatum
Bufo americanus
Pseudacris triseriata triseriata
Rana pipiens

Eastern Garter Snake (P)
Redbelly Snake (P)
Northern Brown Snake (P)
Eastern Painted Turtle (P)
Spotted Salamander (P)
American Toad (P)
Western Chorus Frog (P)
Northern Leopard Frog (P)

BIRDS

The following list contains the species confirmed as of May, 1996. The existing species list is not complete nor confirmed accurate. A further survey would be necessary to compile a complete and accurate list.

Gavia immer
Branta canadensis
Anas platyrhynchos
Fulica americana
Grus canadensis
Chlidonias niger
Charadrius vociferus
Zenaida macroura
Megasceryle alcyon
Picoides pubescens
Colaptes auratus
Tyrannus tyrannus
Myiarchus crinitus
Sayornis phoebe
Contopus virens
Hirundo rustica
Iridoprocne bicolor
Chaetura pelagica
Cyanocitta cristata
Corvus brachyrhynchos

Common Loon
Canada Goose
Mallard
American Coot
Sandhill Crane
Black Tern
Killdeer
Mourning Dove
Belted Kingfisher
Downy Woodpecker
Northern Flicker
Eastern Kingbird
Great Crested Flycatcher
Eastern Phoebe
Eastern Pewee
Barn Swallow
Tree Swallow
Chimney Swift
Blue Jay
American Crow

Parus atricapillus
Sitta carolinensis
Troglodytes aedon
Poliophtila caerulea
Toxostoma rufum
Dumetella carolinensis
Mimus polyglottos
Sialia sialis
Turdus migratorius
Hylocichla mustelina
Vireo olivaceus
Dendroica striata
Dendroica coronata
Dendroica fusca
Setophaga ruticilla
Dendroica palmarum
Dendroica petechia
Vermivora pinus
Geothlypis trichas
Agelaius phoeniceus
Molothrus ater
Quiscalus quiscula
Dolichonyx oryzivorus
Sturnella magna
Sturnella neglecta
Sturnus vulgaris
Piranga olivacea
Passer domesticus
Junco hyemalis
Cardinalis cardinalis
Carduelis tristis
Zonotrichia albicollis
Spizella passerina
Spizella pusilla
Spizella arborea
Melospiza georgiana
Melospiza melodia
Passerculus sandwichensis

Lepisosteus osseus
Amia calva
Coregonus artedii
Salmo trutta
Salvelinus namaycush
Salvelinus namaycush x fontinalis
Esox americanus

Black-capped Chickadee
White-breasted Nuthatch
House Wren
Blue-gray Gnatcatcher
Brown Thrasher
Gray Catbird
Northern Mockingbird
Eastern Bluebird
American Robin
Wood Thrush
Red-eyed Vireo
Blackpoll Warbler
Yellow-rumped Warbler
Blackburnian Warbler
American Redstart
Palm Warbler
Yellow Warbler
Blue-winged Warbler
Common Yellowthroat
Red-winged Blackbird
Brown-headed Cowbird
Common Grackle
Bobolink
Eastern Meadowlark
Western Meadowlark
European Starling
Scarlet Tanager
House Sparrow
Dark-eyed Junco
Northern Cardinal
American Goldfinch
White-throated Sparrow
Chipping Sparrow
Field Sparrow
American Tree Sparrow
Swamp Sparrow
Song Sparrow
Savannah Sparrow

FISH

Longnose Gar
Bowfin
Lake Herring (Rare Fish List)
Brown Trout
Lake Trout
Splake
Grass Pickerel

Esox lucius
Campostoma anomalum
Cyprinus carpio
Notemigonus chrysoleucas
Notropis atherinoides
Notropis cornutus
Notropis hudsonius
Notropis spilopterus
Notropis volucellus
Pimephales notatus
Pimephales promelas
Semotilus atromaculatus
Catostomus commersoni
Ictalurus melas
Ictalurus nebulosus
Ictalurus natalis
Fundulus diaphanus
Labidesthes sicculus
Culaea inconstans
Morone chrysops
Ambloplites rupestris
Lepomis cyanellus
Lepomis gibbosus
Lepomis gulosus
Lepomis macrochirus
Lepomis megalotis
Micropterus dolomieu
Micropterus salmoides
Pomoxis annularis
Pomoxis nigromaculatus
Etheostoma caeruleum
Etheostoma exile
Etheostoma microperca
Etheostoma nigrum
Perca flavescens
Stizostedion vitreum

Northern Pike
Central Stoneroller
Common Carp
Golden Shiner
Emerald Shiner
Common Shiner
Spottail Shiner
Spotfin Shiner
Mimic Shiner
Bluntnose Minnow
Fathead Minnow
Creek Chub
White Sucker
Black Bullhead
Brown Bullhead
Yellow Bullhead
Banded Killifish
Brook Silverside
Brook Stickleback
White Bass
Rock Bass
Green Sunfish
Pumpkinseed
Warmouth
Bluegill
Longear Sunfish (Threatened)
Smallmouth Bass
Largemouth Bass
White Crappie
Black Crappie
Rainbow Darter
Iowa Darter
Least Darter
Johnny Darter
Yellow Perch
Walleye

INVERTEBRATES

There is no invertebrate species list available.

